

SPECIAL NOTE FOR QC/QA SPECIFICATIONS FOR AGGREGATE ACCEPTANCE

This Special Note will apply where indicated on the plans or in the proposal. Section references herein are to the Department's current Standard Specifications for Road and Bridge Construction.

1.0 DESCRIPTION. This Special Note specifies the process control and acceptance testing of aggregates when shown as a bid item. Perform work and furnish materials according to the Department's Standard Specifications with the following exceptions and additions. Perform both process control and acceptance testing. The Department will not perform acceptance testing, but will perform verification testing.

2.0 MATERIALS. Conform to Sections 804 and 805.

3.0 PROCESS.

3.1 Quality Control Plan (QCP). Submit a QCP to the Engineer for review and approval (see Appendix A) at least 15 calendar days before placing aggregates. The QCP is the responsibility of the Contractor and should be a joint effort between the Contractor and any subcontractors. Submit a revised QCP for review and approval if changes are necessary.

3.2 Contractor Requirements.

- 1) Ensure that the aggregate producer conforms to Sections 804 and 805.
- 2) Provide Kentucky Aggregate Sampling Technicians, Kentucky Aggregate Technicians and Kentucky Grading Level I Technicians as appropriate for the application.
- 3) Provide an aggregate testing lab facility accredited by AASHTO or qualified by the Kentucky Transportation Cabinet.
- 4) Job Site Requirements.
 - a) Trip Tickets. Collect trip tickets for each load of aggregate.
 - b) Technician Responsibilities. Use a Kentucky Aggregate Sampling Technician or Kentucky Aggregate Technician to obtain samples. Use a Kentucky Grading Level I Technician for all compaction determinations.
 - c) Visual inspection and oversight of aggregate placement.
- 5) Testing of Aggregates.
 - a) Equipment. Provide test equipment conforming to the requirements of the appropriate test method. Additionally, provide the density meter for Department verification testing. The Engineer may inspect any equipment at any time.
 - b) Gradation and Finer than No. 200. Sample the aggregate at the point of

placement. Use a Kentucky Aggregate Technician to perform sieve analysis. Test the aggregate for compliance with the specified gradations in Sections 804 and 805. Ensure uniform and proper placement of aggregate by visual inspection and oversight performed by the Contractor's designee as defined in the Quality Control Plan. Obtain additional samples anytime visual inspection of the delivered aggregate indicates questionable material. When 2 consecutive failures are encountered, terminate use of the material until remediation measures are taken and the Engineer's approval is obtained. Retain acceptance samples until verification is received from the Department.

- c) Density. The Kentucky Grading Technician will determine densities according to Subsection 302.03.04. When a control strip is required, construct it with direct oversight of the Engineer after attaining an acceptable aggregate gradation. Conform to the procedures described in Subsection 302.03.04 with the exception that the Grading Technician will determine the target density with the determined value approved by the Engineer.
- d) Sampling Frequency. Generate random numbers and randomly sample according to KM-113-03. At a minimum, sample and test the aggregate at the appropriate frequency and under the following conditions as indicated in the table on the following page. Small quantities of 200 tons or less will be reported and documented based on visual inspection for all materials.
- e) Documentation. Record all test results including gradation and density when obtained. Establish measures of quality using the Gradation Spreadsheets and Control Charts provided by the Department (See Appendix B). Provide a summary of test results and trip tickets at least weekly to the Engineer. In the summary, include a record of all failing aggregate with an accompanying explanation. Report all failing tests to the Engineer as soon as possible, but no later than the end of the testing day. Tests should be completed by the day following the sample date. Additional sampling and testing by Contractor is permitted but must be kept separate from acceptance tests.

MATERIAL	SAMPLING FREQUENCY	ACCEPTANCE TESTING
AGRICULTURAL LIMESTONE	NO SAMPLE REQUIRED.	ACCEPT BY CERTIFICATION LETTER FROM AGRICULTURE
CHANNEL LINING, CYCLOPEAN STONE RIP RAP, DUMPED STONE – (DEFLECTOR AND RIFFLE STRUCTURE), GABION STONE AND SLOPE PROTECTION	NO SAMPLE REQUIRED	VISUAL ACCEPTANCE
BASE AGGREGATES (DGA AND CSB)	EACH 2,000 TONS FIVE DENSITIES PER TEST SECTION (APPROX. 2,500 YD ²)	INITIAL GRADATION REQUIRED FOR CONTROL STRIP AND THEREAFTER AS INDICATED DENSITY
FREE DRAINING BEDDING AND BACKFILL	EACH 2,000 TONS OR FRACTION THEREOF	GRADATION AND MINUS NO. 200 WASH
GRANULAR EMBANKMENT – ROADWAY FILL	OFF-SITE MATERIAL - EACH 25,000 TONS OR FRACTION THEREOF ON-SITE MATERIAL – NO SAMPLE REQUIRED.	GRADATION VISUAL ACCEPTANCE
PIPE BEDDING AND SAND FOR BLOTTER	EACH 2,000 TONS OR FRACTION THEREOF	GRADATION
ROCK DRAINAGE BLANKET AND STRUCTURE GRANULAR BACKFILL	EACH 2,000 TONS OR FRACTION THEREOF	GRADATION AND MINUS NO. 200 WASH
SAND DRAINAGE BLANKET	EACH 2,000 TONS OR FRACTION THEREOF	GRADATION
TRAFFIC BOUND USES (BASE, ENTRANCES, MAILBOX TURNOUTS, OR SHOULDERS)	EACH 2,000 TONS OR FRACTION THEREOF	GRADATION, MINUS NO. 200 WASH; MINUS NO. 200 WASH TEST IS WAIVED ON SIZE #57
UNDERDRAIN AND LATERAL DRAIN AGGREGATES	EACH 2,000 TONS OR FRACTION THEREOF	GRADATION, MINUS NO. 200 WASH, (-200 WASH APPLIES ONLY TO COARSE AGGREGATE)
UNTREATED DRAINAGE BLANKETS, (TYPE I) – PAVEMENT	EACH 2,000 TONS OR FRACTION THEREOF	GRADATION
MISCELLANEOUS	EACH 2,000 TONS OR FRACTION THEREOF	AS DICTATED BY APPLICATION

3.3 Aggregate Producer Requirements. Comply with Sections 804 and 805.

3.4 Department Responsibilities. Aggregate Verification Testing. The Engineer will conduct verification testing and compare results.

- 1) Gradation Verification. The Engineer will test at a minimum frequency as follows:

<2000 tons	accept contractor result
2,000-4,000 tons	sample and test
4,000-8,000 tons	sample and test
Every 8,000 tons thereafter	sample and test

The stepped minimum frequencies above assume continuing favorable comparisons. A specification failure invokes a review of contractor results and an immediate resample. Additionally, the failure resets the minimum testing frequency to the 2000-4,000 ton interval above. The Engineer will complete and communicate verification results promptly and in no later than 5 working days. The Engineer reserves the right to increase the testing frequency when deemed necessary. The Engineer will perform verification testing on independent samples. The Engineer may select any portion of aggregate at any time to verify specification limits. Only Kentucky Aggregate Technicians will perform verification testing.

- 2) Density Verification. When a control strip is required, the Engineer will provide direct oversight during its construction. The Engineer will review, for approval, the target density determined by the Grading Technician. Per each 2,500 square yard test section, the Engineer will perform one verification test adjacent to, but not at the same location as, the Contractor's acceptance test. Only Kentucky Grading Technicians will perform verification testing.
- 3) The Department will be responsible for assignment of any deductions.
- 4) Comparison of Verification and Acceptance Testing. The Department will use the Gradation Spreadsheets and Control Charts (See Appendix B) to compare the QC acceptance test results and the corresponding Department verification test results to verify the performance of the sampling and testing procedures. If the verification test results are not within the limits indicated in Table 1 (See Appendix C), an effort will be made to determine the source of the difference.

3.6 Acceptance. The Department will use the Contractor's QC acceptance test results provided verification samples are within stated comparison tolerances. Discrepancies in test results or unfavorable comparisons of verification/acceptance results will require the Engineer's recommendation for resolution. This recommendation will be based upon a review of records, sampling and testing procedures, testing equipment and a resample if indicated. The results of the investigation will be recorded and the recommendation for resolution will be made available to the Contractor. In the event that the Engineer's recommendation does not resolve the difference, use the procedures described in Subsection 113.07 to resolve the dispute.

4.0 MEASUREMENT. The Department will measure the quantity of aggregate according to Section 109 or Subsection 302.04 as applicable.

4.1 Quality Control (QC). The Department will measure the quantity by lump sum according to Subsection 113.08.01.

4.2 Dispute Resolution. The Department will measure the quantity according to Subsection 113.08.02.

5.0 PAYMENT.

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
0001	DGA Base	Ton
0003	Crushed Stone Base	Ton
-----	Aggregate Bid Item	Ton
-----	Dispute Resolution	Subsection 113.08.02
-----	QC	Lump Sum

February 21, 2005

Appendix A - Quality Control Plan/Checklist

Contractor's Quality Control Plan/Checklist

Kentucky Transportation Cabinet

I. Project Information

County: _____ Route: _____
Project No.: _____ PCN: _____

II. Field Office

Location: _____ Telephone No.: _____
Contact Person: _____

III. Field Quality Control Personnel

Quality Control Manager's Name and Certification (If Applicable):

Company
Name: _____
Telephone No. _____

Indicate Contractor's designee responsible for performing visual inspection and oversight of aggregate placement: _____

IV. Field Sampling and Testing

A. Density Tests

Indicate Kentucky Grading Level 1 technician(s) responsible for performing density _____

B. Aggregate Tests

Indicate Kentucky Aggregate Sampling Technician(s) or Kentucky Aggregate Technician(s) responsible for sampling and visual inspection of the aggregate is: _____

Indicate Kentucky Aggregate Technician(s) responsible for performing aggregate tests: _____

Specify the aggregate tests and frequency of all tests performed:

1. _____
2. _____
3. _____
4. _____

V. Failing Tests and Defective Work

Indicate the actions to be taken and the communication procedures between the Aggregate Producer, The Contractor, the Consultant, and Department Personnel in the event of failing tests or observation of defective work: _____

VI. Field Documentation

Provide examples of the forms that will be used to maintain documentation at the jobsite: _____

VII. Pre-Project Meeting

Indicate when a pre-project meeting will be scheduled: _____

This is to certify that adequate facilities and personnel will be available and utilized to comply with The Kentucky Standard Specifications.

Quality Control Manager:

Date:

Signature

Appendix B - Gradation Spreadsheets and Control Charts

The Gradation spreadsheets provided by the Department are intended to provide a uniform procedure for reporting test results and to allow the Engineer to quickly compare verification and acceptance samples. The Control Charts are intended to provide a visual assessment of the gradation trends for aggregate used on a project. The Charts are available for download from the Department's website. A brief overview of this process follows.

Either electronically or manually, the Contractor will enter the acceptance test results required in the indicated area on the spreadsheet. This data will be transmitted to the responsible District Materials Engineer or designated individual weekly. The Engineer will then enter the verification test results as indicated on the same spreadsheet. The verification test will be compared to both the applicable specification and the corresponding acceptance test.

The corresponding acceptance test will be the average of the sample taken immediately preceding the verification sample and that immediately following the verification sample. If no acceptance test is available after the verification sample, the last 2 preceding acceptance sample tests will be averaged. The Engineer will verify specification compliance and report test results to the Contractor according to Section 3.4.4). At the end of the project the Engineer will transmit the Gradation Spreadsheets and Control Charts to the Division of Materials.

Appendix C - Table 1 Limits for Comparison of Verification and Acceptance Testing

TYPE OF TEST	MATERIAL	MAXIMUM DIFFERENCE BETWEEN TEST RESULTS
DRY SIEVE ANALYSIS WASH TEST	Aggregate Bid Items	Sieves 1-inch or larger 10.0% Sieves #8 thru ¾-inch 6.0% Sieves #100 thru #16 5.0% Sieve #200 4.0% - 200 Wash Test 2.0%
-200 WASH TEST AND WET SIEVE ANALYSIS	DGA, CSB	Sieves > #16 8.0% Sieves #100 Thru # 16 5.0% Sieve # 200 2.0%
DENSITY	DGA, CSB	4 pcf